



U.S. Department  
of Transportation

Pipeline and  
Hazardous Materials  
Safety Administration

COMPETENT AUTHORITY CERTIFICATION  
FOR A TYPE B(U)  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/0674/B(U)-96, REVISION 6

East Building, PHH-23  
1200 New Jersey Avenue SE  
Washington, D.C. 20590

REVALIDATION OF CANADIAN COMPETENT AUTHORITY  
CERTIFICATE CDN/2076/B(U)-96

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - MDS Nordion Model No. F-430/GC-40; F-430/GC-1000 and GC-3000; F-430/CIS Model IBL 437C; F-430/CIS Model IBL 637; or F-430/Molsgaard Model GC-2000.
2. Package Description and Authorized Radioactive Contents - as described in Canada Certificate of Competent Authority CDN/2076/B(U)-96, Revision 7 (attached).
3. General Conditions -
  - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
  - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
  - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

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<sup>1</sup> "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

**CERTIFICATE USA/0674/B(U)-96, REVISION 6**

- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations<sup>1</sup> shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.
4. Marking and Labeling - The package shall bear the marking USA/0674/B(U)-96 in addition to other required markings and labeling.
5. Expiration Date - This certificate expires on February 28, 2011.

This certificate is issued in accordance with paragraph 808 of the IAEA Regulations and Section 173.473 of Title 49 of the Code of Federal Regulations, in response to the December 12, 2008 petition by Best Theratronics Ltd., Ottawa, Ontario, and in consideration of other information on file in this Office.

Certified By:



Robert A. Richard  
Deputy Associate Administrator for Hazardous Materials Safety

**Jan 12 2009**  
(DATE)

Revision 6 - Issued to revalidate Canadian Certificate of Competent Authority No. CDN/2076/B(U)-96, Revision 7.



Canadian Certificate No. <b>CDN/2076/B(U)-96 (Rev. 7)</b>	Issue Date <b>Nov-27-2008</b>	Expiry Date <b>Feb-28-2011</b>	CNSC File <b>30-A2-239-0</b>
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## **Certificate for Transport Package Design**

The transport package design identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and Section 7 of the *Packaging and Transport of Nuclear Substances Regulations*, and to the 1996 Edition (Revised) of the *IAEA Regulations for the Safe Transport of Radioactive Material*.

### **REGISTRATION OF USE OF PACKAGES**

All users of this authorization shall register their identity in writing with the Canadian Nuclear Safety Commission prior to the first use of this authorization and shall certify that they possess the instructions necessary for preparation of the package for shipment.

### **PACKAGE IDENTIFICATION**

Designer: **MDS Nordion**  
Make/Model: **F-430/GC-40; F-430/GC-1000 and GC-3000; F-430/CIS model IBL 437C;  
F-430/CIS model IBL 637; F-430/Molsgaard model GC-2000; and F-430/Gammator M38**  
Mode of Transport: **Air, Sea, Road, Rail**

### **IDENTIFICATION MARK**

The package shall bear the competent authority identification mark "**CDN/2076/B(U) - 96**".

### **PACKAGE DESCRIPTION**

The packaging consists of the F-430 overpack and the GC-40; IBL 437C; IBL 637; GC-1000; GC-2000; GC-3000 or Gammator M38 irradiator body. The F-430 overpack provides impact and thermal protection for the radioactive contents. Containment is provided by either the special form sealed sources or the CSL 12, CSL 15 and CSL 20 sources or the "ORNL-RAMCO-50" sealed sources placed inside the irradiators.

The F-430 overpack is a stainless steel drum placed on a mild steel skid and consists of three layers of 12 gage stainless steel walls with polyurethane foam between them. The cavity between the outer and middle walls is filled with 150 mm of 128 kg/m<sup>3</sup> low density foam for impact and thermal protection. The cavity between the inner wall and the middle wall is filled with 25 mm of 640 kg/m<sup>3</sup> high density foam to prevent direct flame exposure to the contents from the thermal test. Four hoist rings are provided on the top surface for overhead lifting and a tie down collar is fitted to the overpack at the time of shipping.



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The cabinet and the bottom part which consists of four legs and the drive system are removed from the IBL 437C during transport.

MDS Nordion drawing numbers of the packages are as follows:

**GC-40:** Drawing No. F643001-001, Sheet 1 of 2, (Issue K); Sheet 2 of 2, (Issue D);

**GC-1000 and GC-3000:** Drawing No. F643001-002, Sheet 1 of 2; Sheet 2 of 2 (Issue B);

**IBL 437C:** Drawing No. F643001-005 (Issue A);

**IBL 637:** Drawing No. F643001-004 (Issue B);

**GC-2000:** Drawing No. F643001-003 (Issue B); and

**Gammator M38:** Drawing No. C102202006 (Issue A).

Illustrations of the various configurations of the F-430 packages with GC-40, GC-1000, GC-3000 and IBL-437C are shown on attached MDS Nordion Drawing No. F-430, Sheets 1 of 3 to 3 of 3, (Issue 5).

The various configurations of the packages are as follows:

**F-430/GC-40:**

Shape: **Drum**  
Mass: **3175 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**

**F-430/GC-1000 and GC-3000:**

Shape: **Drum**  
Mass: **2655 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**

**F-430/CIS model IBL 437C:**

Shape: **Drum**  
Mass: **3475 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**





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**F-430/CIS model IBL 637:**

Shape: **Drum**  
Mass: **3290 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**

**F-430/Molsgaard model GC-2000:**

Shape: **Drum**  
Mass: **2452 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**

**F-430/Gammator M38:**

Shape: **Drum**  
Mass: **2655 kg**  
Length: **n/a**  
Width: **n/a**

Shielding: **Lead**  
Outer Casing: **Stainless Steel**  
Height: **1270 mm**  
Diameter: **1270 mm**

**AUTHORIZED RADIOACTIVE CONTENTS**

The packages are authorized to contain Cesium 137 in the form of compressed cesium chloride powder pellets as follows:

- (a) the F-430/GC-40 package is authorized to contain not more than 74 TBq (2,000 Ci) of Cesium 137;
- (b) the F-430/GC-1000; F-430/GC-3000 and F-430/Gammator M38 are authorized to contain not more than 113 TBq (3,050 Ci) each of Cesium 137;
- (c) the F-430/IBL 437C package is authorized to contain not more than 190 TBq (5100 Ci) of Cesium 137;
- (d) the F-430/IBL 637 package is authorized to contain not more than 222 TBq (6000 Ci) of Cesium 137;  
and
- (e) the F-430/GC-2000 package is authorized to contain not more than 66.6 TBq (1800 Ci) of Cesium 137.

Only sources with a valid special form radioactive material certificate or the "ORNL-RAMCO-50" (Radiation Machinery Corp.), the CSL 12, CSL 15 and CSL 20 sources are authorized.



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### QUALITY ASSURANCE

Quality assurance for the design, manufacture, testing, documentation, use, maintenance and inspection of the package shall be in accordance with:

- MDS Nordion Document No. IN/QA 0224 Z000 (7)\*, "Radioactive Material Transport Package Quality Plan"
- MDS Nordion Technical Specification No. IN/DS 1891 F430 (4), "Design, Manufacturing and Operating Specification for the F430 Transport Package"
- MDS Nordion Document No. IN/QA 0562 A000 (4)\*, "Sealed Source Quality Plan"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations
- \* or latest current revision

### SHIPMENT

The preparation for shipment of the package shall be in accordance with:

- MDS Nordion Technical Specification No. IN/DS 1891 F430 (4), "Design, Manufacturing and Operating Specification for the F430 Transport Package"
- Canadian Packaging and Transport of Nuclear Substances Regulations
- IAEA Regulations

This certificate does not relieve the shipper from any requirement of the government of any country through or into which the package will be transported.



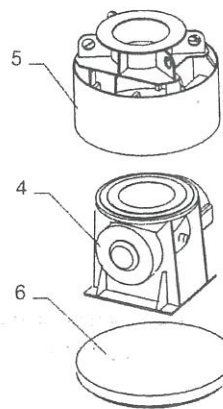
Canadian Certificate No. <b>CDN/2076/B(U)-96 (Rev. 7)</b>	Issue Date <b>Nov-27-2008</b>	Expiry Date <b>Feb-28-2011</b>	CNSC File <b>30-A2-239-0</b>
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S. Faille

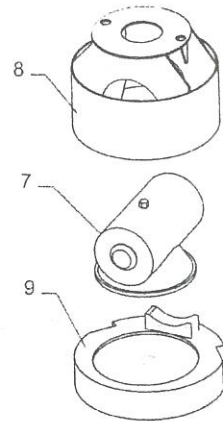
Designated Officer pursuant to paragraph 37(2)(a)  
of the Nuclear Safety and Control Act

## Parts List

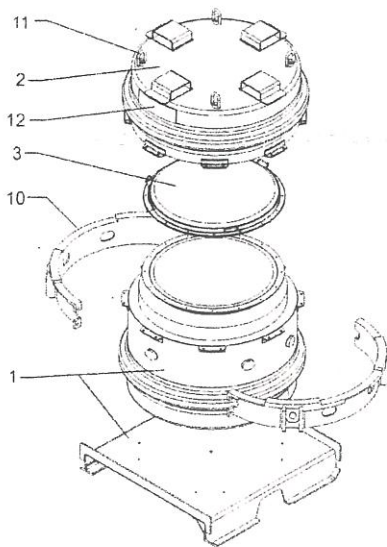
1. Overpack - Body and Skid
2. Overpack - Lid (16 Bolts, m 5/8-UNC, Gr. 5, 1 Security Seal)
3. Overpack - Inner Lid (16 Bolts, 5/8-UNC, Gr. 5)
4. GC-40 Irradiator, Lower Head
5. Steel Brace, Lower Head
6. Wooden Base, Lower Head
7. GC-40 Irradiator, Upper Head
8. Steel Brace, Upper Head
9. Wooden Base, Upper Head
10. Tie-Down Collar (2 pieces)
11. Lifting Hoist Rings
12. Radiation warning and identification plates (2 sides)
13. Cesium-137 Source in storage position
14. Source Drawer (lead filled, brass encased)
15. Lead Shielding (15 cm)



LOWER HEAD  
LOADING CONFIGURATION

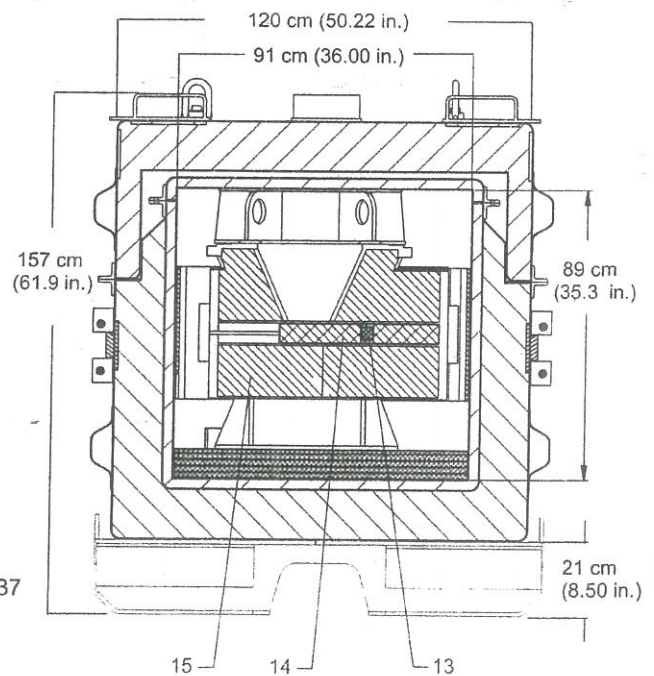


UPPER HEAD  
LOADING CONFIGURATION



## Notes

1. Meets IAEA Type B(U)-96 requirements
2. Gross weight: 3,175 kg (7,000 lb.)
3. Floor Loading (based on projected floor area 1,815 kg/m<sup>2</sup> (372 lb./ft.<sup>2</sup>))
4. Maximum Radioactive contents: 74 TBq (2,000 Ci) of Cs-137
5. Maximum Contents weight: 1,820 kg (4,000 lb.)
6. Transport cavity size: 91 cm diameter, 90 cm high
7. Preparation for Shipment Procedure IN/PP 1611 F430



SIDE CROSS-SECTIONAL VIEW  
WITH LOWER HEAD

04 APR 2007

**MDS Nordion**

447 March Road, P.O. Box 13500  
Kanata, Ontario, Canada, K2K 1X8  
Tel: (613) 592-2790 · Fax: (613) 592-6937

TITLE

**F-430/GC40 Transport Package**

REF. IN/SS 1682 F430

REVISED Mar. 07

CF-555

DATE September 2000

No.

**F-430**

ISSUE

**5**

DRAWN

CHECKED

APPROVED

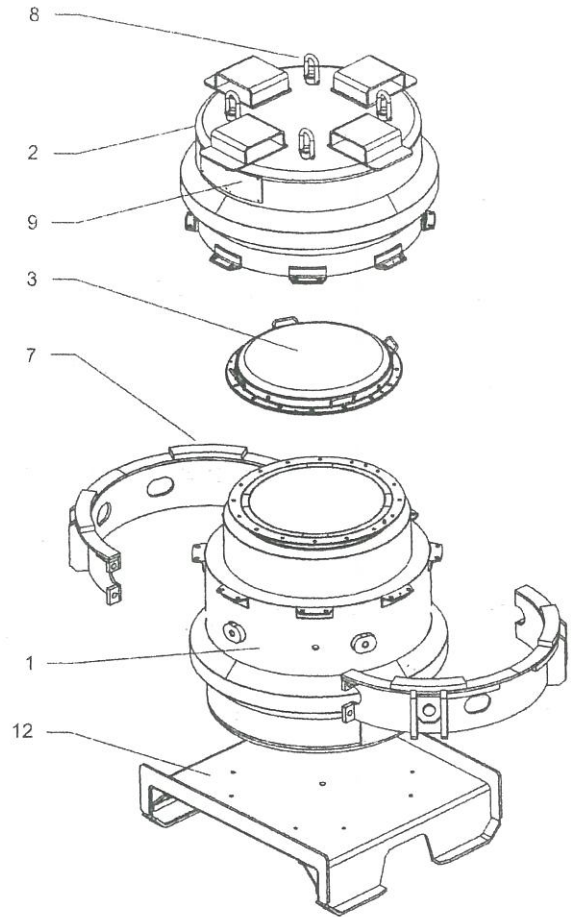
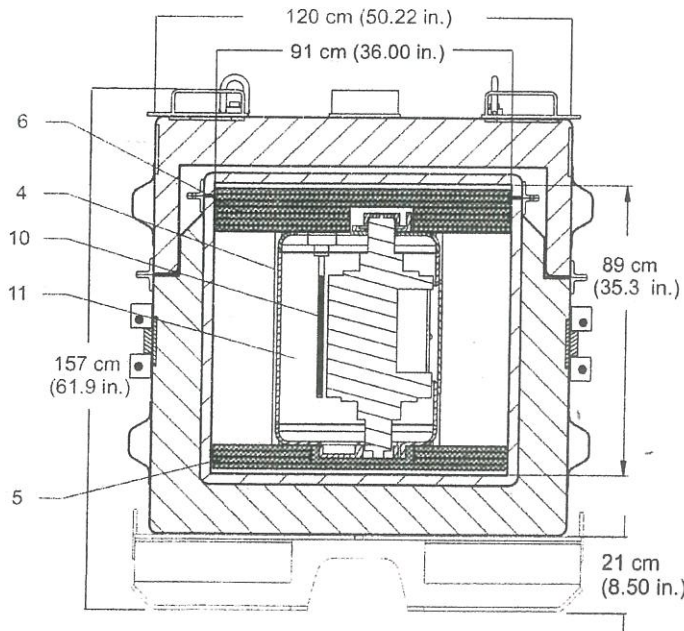
SHEET 1 OF 3

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# Parts List

1. Overpack - Body
2. Overpack - Lid (16 Bolts, 5/8-UNC, Gr. 5, 1 Security Seal)
3. Overpack - Inner Lid (16 Bolts, 5/8-UNC, Gr. 5)
4. Gammacell Irradiator (GC1000 or GC3000)
5. Lower Internal Brace
6. Upper Internal Brace
7. Tie-Down Collar (2 pieces)
8. Lifting Hoist Rings (4 pieces)
9. Radiation warning and identification plates (2 sides)
10. Cesium-137 Sources
11. Lead Shielding
12. Shipping Skid



## Notes

1. Meets IAEA Type B(U)-96 requirements
2. Gross weight: 2,655 kg (5,853 lb.)
3. Floor Loading (based on projected floor area 1,517 kg/m<sup>2</sup> (311 lb./ft.<sup>2</sup>))
4. Maximum Radioactive contents: 113 TBq (3050 Ci) of Cs-137
5. Maximum Contents weight: 1,820 kg (4,000 lb.)
6. Transport cavity size: 91 cm diameter, 90 cm high
7. Preparation for Shipment Procedure IN/PP 1611 F430

**MDS Nordion**

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## TITLE

**F-430/GC1000 and F-430/GC3000  
Transport Packages**

REF. IN/SS 1682 F430

REVISED Mar. 07

CF-555

DATE September 2000

No.

**F-430**

ISSUE

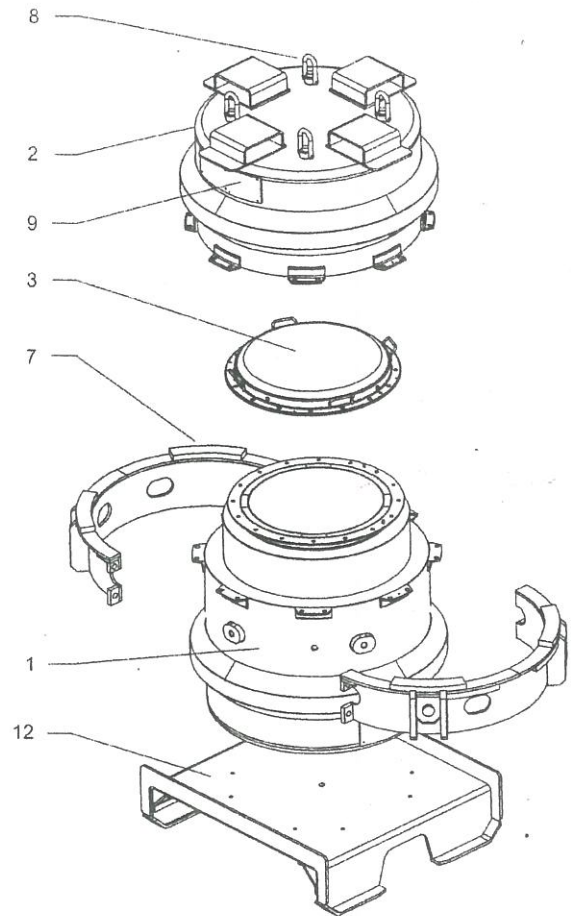
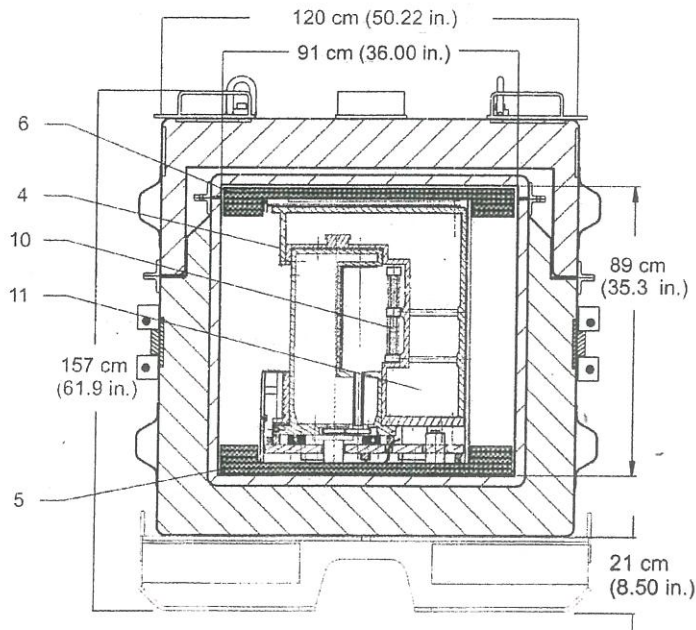
**5**

DRAWN CHECKED APPROVED

SHEET 2 OF 3

# Parts List

1. Overpack - Body
2. Overpack - Lid (16 Bolts, 5/8-UNC, Gr. 5, 1 Security Seal)
3. Overpack - Inner Lid (16 Bolts, 5/8-UNC, Gr. 5)
4. IBC 437 C Irradiator
5. Lower Internal Brace
6. Upper Internal Brace
7. Tie-Down Collar (2 pieces)
8. Lifting Hoist Rings (4 pieces)
9. Radiation warning and identification plates (2 sides)
10. Cesium-137 Sources
11. Lead Shielding
12. Shipping Skid



## Notes

1. Meets IAEA Type B(U)-96 requirements
2. Gross weight: 3,475 kg (7,661 lb.)
3. Floor Loading (based on projected floor area 1,985 kg/m<sup>2</sup> (407 lb./ft.<sup>2</sup>))
4. Maximum Radioactive contents: 190 TBq (5100 Ci) of Cs-137
5. Maximum Contents weight: 1,820 kg (4,000 lb.)
6. Transport cavity size: 91 cm diameter, 90 cm high
7. Preparation for Shipment Procedure IN/PP 1611 F430

**MDS Nordion**

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## TITLE

**F-430/IBL 437 C Transport Package**

REF. IN/SS 1682 F430	REVISED Mar. 07	CF-555
DATE September 2000	No. <b>F-430</b>	ISSUE <b>5</b>
<div> <div> DRAWN BW </div> <div> CHECKED ume </div> <div> APPROVED BM </div> </div>	SHEET 3 OF 3	



U.S. Department  
of Transportation

Pipeline and  
Hazardous Materials  
Safety Administration

East Building, PHH-23  
1200 New Jersey Avenue SE  
Washington, D.C. 20590

**CERTIFICATE NUMBER:** USA/0674/B(U)-96, Revision 6

**ORIGINAL REGISTRANT(S):**

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